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EXAMINER	
TORRES, JUAN A	
ART UNIT	**PAPER NUMBER**
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/676,503	CARBONARI, DAVID	
	Examiner	Art Unit	
	Juan A. Torres	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-34 and 36-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-34 and 36-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 July 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The modifications to the drawings were received on 07/19/2006. These modifications are accepted by the Examiner.

In view of the amendment filed on 07/19/2006, the Examiner withdraws drawing objections of the previous Office action.

The drawings are objected to because:

a) In figure 9C block 276 the recitation "First Quantized Signal and First Output Signal Multiplier" is improper (see amended figure 8 block 230); it is suggested to be changed to "First Quantized Signal and Second Output Signal Multiplier".

b) In figure 9C block 278 the recitation "Second Quantized Signal and Second Output Signal Multiplier" is improper (see amended figure 8 block 232); it is suggested to be changed to "Second Quantized Signal and First Output Signal Multiplier".

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering

of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The modifications to the specification were received on 07/19/2006. These modifications are accepted by the Examiner.

In view of the amendment filed on 07/19/2006, the Examiner withdraws specification objections of the previous Office action.

The disclosure is objected to because of the following informalities: in page 21, lines 1-12 the recitation "The difference signal generator 262 receives quantized first and second output signals from the first and second output signal quantizer 260. The first quantized signal and the second output signal may be multiplied by the first quantized signal and first output signal multiplier 276. The second quantized signal and the first output signal may be multiplied by the second quantized signal and second output signal multiplier 278. Output from the first quantized signal and first output signal multiplier 276 and the second quantized signal and second output signal multiplier 278 may be transmitted to an algebraic difference calculator 280. The algebraic difference calculator 280 may be a summer that sums the first and second quantized signals to determine a difference between the first and second quantized signals. The difference may be represented as a difference signal. The difference signal may then be

transmitted to a difference signal filter 282. The difference signal filter 282 is preferably a low-pass filter" is improper, see figures 4 and 8; it is suggested to be changed to "The difference signal generator 262 receives quantized first and second output signals from the first and second output signal quantizer 260. The first quantized signal and the second output signal may be multiplied by multiplier 276. The second quantized signal and the first output signal may be multiplied by multiplier 278. Output from multiplier 276 and the second multiplier 278 may be transmitted to an algebraic difference calculator 280. The algebraic difference calculator 280 may be a summer that sums the first and second quantized signals to determine a difference between the first and second quantized signals. The difference may be represented as a difference signal. The difference signal may then be transmitted to a difference signal filter 282. The difference signal filter 282 is preferably a low-pass filter".

Claim Objections

The modifications to the claims were received on 07/19/2006. These modifications are accepted by the Examiner.

In view of the amendment filed on 07/19/2006, the Examiner withdraws claim objections to claims 1-57 of the previous Office action.

Claim Rejections - 35 USC § 112

The modifications to the claims were received on 07/19/2006. These modifications are accepted by the Examiner.

In view of the amendment filed on 07/19/2006, the Examiner withdraws claim rejections under 35 USC 112 first paragraph to claims 6-8 and 34-36; 10-13 and 38-41 of the previous Office action.

In view of the amendment filed on 07/19/2006, the Examiner withdraws claim rejections under 35 USC 112 second paragraph to claims 7, 8, 11, 12, 18, 27, 35, 36, 39, 40, 42, 46, and 55 of the previous Office action.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 21, 22, 49, and 50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claims 21 and 49, claims 21 and 49 is rejected because they claim "multiplying a first quantized signal with the first output signal", but in figure 4 and the description in page 12 lines 9-13 discloses "multiplying a first quantized signal with the second output signal", so claims 21 and 49 are vague and indefinite, because they do not represent what is disclosed in the drawings and in the specification.

As per claims 22 and 50, claims 22 and 50 is rejected because they claim "multiplying a second quantized signal with the second output signal", but in figure 4 and the description in page 12 lines 9-13 discloses "multiplying a second quantized signal with the first output signal", so claims 22 and 50 are vague and indefinite, because they do not represent what is disclosed in the drawings and in the specification.

Response to Arguments

Regarding claims 1, 29 and 57:

Applicant's arguments filed on 07/19/2006 have been fully considered but they are not persuasive.

The Applicant contends, "In the Office Action, claims 1, 2, 5-7, 9-10, 14-24, 27-30, 33-35, 37-38, 42-52, and 55-57 stand rejected as unpatentable under 35 U.S.C. § 103(a) over U.S. patent 6,8 10,087 B2 ("Hoctor") in view of U.S. Patent 4,419,759 A ("Poklemba"). Applicant respectfully traverses this rejection. The rejection of claims 7 and 35 is now moot as these claims have been cancelled. A. The Law of Obviousness. In order to establish aprima facie case of obviousness, three basic criteria must be met: "First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined), must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on the applicant's disclosure." M.P.E.P. § 2142. I.No motivation to combine references M.P.E.P. § 2143.01 states: "if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teaching of the references are not sufficient to render the claims prima facie obvious." In the Office Action, the Examiner states the motivation to combine as follows: "Hoctor and Poklemba are analogous art

because they are from a similar problem solving area of carrier recovery At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration." (emphasis added). This statement leads the Applicant to believe that the Examiner may be mistaken in his understanding of ultra-wideband communications systems. This. is because the proposed combination of a narrowband carrier based system, taught by Poklemba, with the ultra-wideband impulse based system, taught by Hoctor, would change the basic principals of operation of either reference. Put differently, each reference teaches a distinct, and different communication technology, which operate in fundamentally different ways, and therefore one skilled in the art would not be motivated to combine these references. To explain, Hoctor teaches that "[u]ltra wideband) systems operate by transmitting and receiving a sequence of very short radio frequency (RF) pulses, the duration of which is typically less than a nanosecond" (col. 1, lines 16-19). But Poklemba teaches "concurrent synchronization of carrier phase and clock timing in dual sideband suppressed carrier transmission systems. The proposed combination of a narrowband carrier based system, taught by Poklemba, with the ultra-wideband pulse based system, taught by Hoctor, Would change the basic principals of operation of either reference, and is a practical impossibility. For example, would Hoctor's pulses be superimposed on Poklemba's carrier? Or would the proposed combination operate by attempting to phase lock to a carrier as taught in Poklemba, when no carrier is present in the Hoctor pulses?

These references are clearly apples and oranges. Poklemba describes a continuous sinusoidal signal $r(t) = \sum_{i=1}^{N} a_i(t - iT)\cos(wt) + b_i(t - iT)\sin(wt)$ [see column 4, line 11], whereas Hoctor teaches an ultra-wideband pulse based system that transmits nanosecond pulses, as discussed above. Applicant submits that no motivation to combine these references can exist, as it is a practical impossibility to combine them".

The Examiner disagrees and asserts, that, Hoctor disclose an ultra wideband system that uses a QAM with in-phase and quadrature signals modulation with a local oscillator (figures 10A-10D). Poklemba discloses that in quadrature systems to maintain the orthogonally of the in-phase and the quadrature signals is possible to use a Costas loop, that multiply the in-phase signal and the quadrature signals, this multiplication in theory should be zero because the signals are orthogonal, the systems uses the deviation in the orthogonally to modify the local oscillator, this is well known in the art as was presented in the previous Office action in the conclusions section. Also in the previous Office action was presented patents that acknowledge the use of the Costas loop in a ultra wideband system (Richards (US 6925109 B2) discloses de use of a Costa Loop in a UWB receiver (column 40 line 54 to column 41 line 4). The Costas Loop will maintain the signals as orthogonal as possible.

The Applicant contends, "II. Reasonable Expectation of Success. The second prong of a prima facie case of obviousness requires a reasonable expectation of success. "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on the applicant's disclosure." M.P.E.P. § 2142. As discussed above any combination of

Hoctor with Poklemba would result in an inoperable combination. An ultra-wideband device taught by Hoctor, employing the carrier recovery techniques of Poklemba would fail to recover a carrier since none is present in the transmitted signal. A continuous wave system (Poklemba) attempting to regenerate a carrier from a pulsed based system (Hoctor) would fail for the same reason. There is no carrier present in the signal to recover. Since any proposed combination of these references results in an inoperable combination, one skilled in the art would not have a reasonable expectation of success when attempting to combine the cited references. Therefore, Applicant respectfully requests the Examiner reconsider and withdrawal this rejection".

The Examiner disagrees and asserts, that, as indicated previously, Hoctor disclose an ultra wideband system that uses a QAM with in-phase and quadrature signals modulation with a local oscillator (figures 10A-10D). Poklemba discloses that in quadrature systems to maintain the orthogonally of the in-phase and the quadrature signals is possible to use a Costas loop, that multiply the in-phase signal and the quadrature signals, this multiplication in theory should be zero because the signals are orthogonal, the systems uses the deviation in the orthogonally to modify the local oscillator, this is well known in the art as was presented in the previous Office action in the conclusions section. Also in the previous Office action was presented patents that acknowledge the use of the Costas loop in a ultra wideband system (Richards (US 6925109 B2) discloses de use of a Costa Loop in a UWB receiver (column 40 line 54 to column 41 line 4). The Examiner disagrees and asserts, that, Hoctor disclose an ultra wideband system that uses a QAM with in-phase and quadrature signals modulation

with a local oscillator (figures 10A-10D). Poklemba discloses that in quadrature systems to maintain the orthogonally of the in-phase and the quadrature signals is possible to use a Costas loop, that multiply the in-phase signal and the quadrature signals, this multiplication in theory should be zero because the signals are orthogonal, the systems uses the deviation in the orthogonally to modify the local oscillator, this is well known in the art as was presented in the previous Office action in the conclusions section. Also in the previous Office action was presented patents that acknowledge the use of the Costas loop in a ultra wideband system (Richards (US 6925109 B2) discloses de use of a Costa Loop in a UWB receiver (column 40 line 54 to column 41 line 4). The Costas Loop will maintain the signals as orthogonal as possible.

The Costas Loop will maintain the in-phase and the quadrature signals as orthogonal as possible.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

For these reasons and the reasons indicated in the previous Office action the rejections of claims 1, 29 and 57 are maintained.

Regarding claims 19-23:

Applicant's arguments filed on 07/19/2006 have been fully considered but they are not persuasive.

The Applicant contends, "In view of the above discussion, Applicant respectfully submits that the Section 103 rejection of independent claims 1, 29 and 57 has been traversed. Because claims 2-6, 8-28, 30-34 and 36-56 depend from either claim 1 or 29, it is respectfully submitted that the rejection of claims 2-6, 8-28, 30-34 and 36-56 have been traversed by virtue of their dependency from either claim 1 or 29. M.P.E.P. § 2143.03".

The Examiner disagrees and asserts, that, because the rejection of claims 1, 19 and 57 are maintained, the rejections of claims 2-6, 8-28, 30-34 and 36-56 are also maintained.

For these reasons and the reasons indicated in the previous Office action the rejections of claims 2-6, 8-28, 30-34 and 36-56 are maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 5-6, 9-10, 14-24, 27-30, 33-34, 37-38, 42-52, and 55-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoctor (US 6810087 B2) in view of Poklemba (US 4419759 A).

As per claims 1 and 29, Hoctor discloses receiving an incoming signal, wherein the incoming signal comprises a plurality of ultra-wideband pulses (figure 10D block 201; column 7 lines 40-44); approximating the incoming signal (figure 10D block 202;

column 7 lines 40-44); generating a local signal (figure 10D block 204; column 8 lines 1-4); and generating a first output signal and a second output signal (figure 10D blocks 203a and 203b; column 7 lines 44-60). Hoctor doesn't disclose quantizing the first output signal and the second output signal to produce a first quantized signal and a second quantized signal; generating a difference signal for the first quantized signal and the second quantized signal; and providing an error signal based on the difference signal. Poklemba discloses quantizing the first output signal and the second output signal to produce a first quantized signal and a second quantized signal (figure 1 blocks 22 and 28; column 1 lines 25-40); generating a difference signal for the first quantized signal and the second quantized signal (figure 1 blocks 24, 30 and 32; column 1 lines 41-45); and providing an error signal based on the difference signal (figure 1 output block 32 and input block 34; column 1 lines 25-40). Hoctor and Poklemba are analogous art because they are from similar problem solving area of orthogonally of quadrature signal for carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

As per claims 2 and 30, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses that local signal uses a phase-locked loop (abstract; figure 1; column 1 lines 25-40). Hoctor and Poklemba are analogous art because they are from

similar problem solving area of orthogonally of quadrature signal for carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

As per claims 5 and 33, Hoctor and Poklemba disclose claims 1 and 30, Poklemba also discloses to produce a first duplicate signal and a second duplicate signal. Poklemba also discloses the use of filters (figure 1 block 20, 26 and 30; figure 2 block 48; figure 3 block 68; figure 6 blocks 112, 116 and 122; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of orthogonally of quadrature signal for carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

As per claims 6 and 34, Hoctor and Poklemba disclose claims 5 and 33, Poklemba also discloses using at least one low-pass filters (figure 1 block 20, 26 and 30; figure 2 block 48; figure 3 block 68; figure 6 blocks 112, 116 and 122; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of orthogonally of quadrature signal for carrier recovery. At the time of the

invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

As per claims 9 and 37, Hoctor and Poklemba disclose claims 5 and 33, Poklemba also discloses using a matched filter (figure 1 block 20, 26 and 30; figure 2 block 48; figure 3 block 68; figure 6 blocks 112, 116 and 122; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of orthogonally of quadrature signal for carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

As per claims 10 and 38, Hoctor and Poklemba disclose claims 9 and 37, Poklemba also discloses that the matched filter comprises a band-pass filter (figure 3 block 68; figure 4 block 82 and figure 5 block 94; figure 6 blocks 112, 116 and 122; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of orthogonally of quadrature signal for carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier

synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

As per claims 14 and 42, Hoctor and Poklemba disclose claims 1 and 29, Hoctor also discloses multiplying a first duplicate signal and the incoming signal to produce a first output signal (figure 10D block 203a; column 7 lines 44-60).

As per claims 15 and 43, Hoctor and Poklemba disclose claims 14 and 29, Hoctor also discloses delaying a phase of a second duplicate signal to produce a delayed phase signal (figure 10D block 205; column 7 lines 44-60).

As per claims 16 and 44, Hoctor and Poklemba disclose claims 15 and 43, Hoctor also discloses using a delay circuit from the group consisting of a 90-degree phase delay circuit and a 270-degree phase delay circuit (figure 10D block 205; column 7 lines 44-60).

As per claims 17 and 45, Hoctor and Poklemba disclose claims 15 and 43, Hoctor also discloses delaying a rising edge of the incoming signal (figure 10D block 205; column 7 lines 44-60).

As per claims 18 and 46, Hoctor and Poklemba disclose claims 17 and 45, Hoctor also discloses delaying shapes the incoming signal to approximately a one bit time duration (figure 10D block 205; column 7 lines 44-60).

As per claims 19 and 47, Hoctor and Poklemba disclose claims 1 and 29, Hoctor also discloses multiplying a delayed phase signal and the incoming signal to produce a second output signal (figure 10D block 203b; column 7 lines 44-60).

As per claims 20 and 48, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses filtering the first output signal and the second output signal (figure 1 blocks 20 and 26; figure 6 blocks 110, 112; column 1 lines 25-45; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of orthogonally of quadrature signal for carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

As per claims 21 and 49, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses multiplying a first quantized signal with the first output signal (figure 6 block 200; column 4 lines 25-48; figure 1 block 24; figure 6 block 126; column 1 lines 25-45; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of orthogonally of quadrature signal for carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

As per claims 22 and 50, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses multiplying a second quantized signal with the second output

signal (figure 6 block 204; column 4 lines 25-48; figure 1 block 30; figure 6 block 124; column 1 lines 25-45; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of orthogonally of quadrature signal for carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

As per claims 23 and 51, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses calculating an algebraic difference between the first quantized signal and the second quantized signal (figure 1 block 32; figure 6 block 128; column 1 lines 25-45; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of orthogonally of quadrature signal for carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

As per claims 24 and 52, Hoctor and Poklemba disclose claims 1 and 29, Poklemba also discloses filtering the difference signal (figure 1 block 34; figure 6 block 130; column 1 lines 25-45; column 4 lines 25-48). Hoctor and Poklemba are analogous art because they are from similar problem solving area of orthogonally of quadrature

signal for carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

As per claims 27 and 55, Hoctor and Poklemba disclose claims 1 and 29, Hoctor also discloses each of the plurality of ultra-wideband pulses has a duration ranging from about 10 picoseconds to about 1 millisecond (column 10 lines 1-17).

As per claims 28 and 56, Hoctor and Poklemba disclose claims 1 and 29, Hoctor also discloses each of the plurality of ultra-wideband pulses has at least one of a phase and amplitude that conveys data (column 4 lines 18-32).

As per claim 57, Hoctor discloses means for receiving an incoming signal, wherein the incoming signal comprises a plurality of ultra-wideband pulses (figure 10D block 201; column 7 lines 40-44); means for approximating the incoming signal (figure 10D block 202; column 7 lines 40-44); means for generating a local signal (figure 10D block 204; column 8 lines 1-4); and means for generating a first output signal and a second output signal (figure 10D blocks 203a and 203b; column 7 lines 44-60). Hoctor doesn't disclose means for quantizing the first output signal and the second output signal to produce a first quantized signal and a second quantized signal; means for generating a difference signal for the first quantized signal and the second quantized signal; means for and providing an error signal based on the difference signal. Poklemba discloses means for quantizing the first output signal and the second output

signal to produce a first quantized signal and a second quantized signal (figure 1 blocks 22 and 28; column 1 lines 25-40); means for generating a difference signal for the first quantized signal and the second quantized signal (figure 1 blocks 24, 30 and 32; column 1 lines 41-45); means for and providing an error signal based on the difference signal (figure 1 output block 32 and input block 34; column 1 lines 25-40). Hoctor and Poklemba are analogous art because they are from similar problem solving area of orthogonally of quadrature signal for carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor the carrier synchronization disclosed by Poklemba. The suggestion/motivation for doing so would have been to obtain effective carrier regeneration reducing the orthogonally between quadrature signals (Poklemba abstract).

Claims 3, 4, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoctor and Poklemba as applied to claim 2 above, and further in view of Flach (US 20010034475 A1).

As per claims 3 and 31, Hoctor and Poklemba disclose claims 2 and 30, Hoctor and Poklemba don't disclose that the phase-locked loop is gated. Flach discloses a gated phase-locked loop is gated (figure 5A block 536; paragraph [0139]). Hoctor, Poklemba and Flach are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the gated VCO technique disclosed by Flach. The

suggestion/motivation for doing so would have been to conserve power (Flach paragraph [0139]).

As per claims 4 and 32, Hoctor, Poklemba and Flach disclose claims 3 and 31. Flach also discloses the phase-locked loop is gated by the incoming signal (figure 5A block 536; paragraph [0139]). Hoctor, Poklemba and Flach are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the gated vco technique disclosed by Flach. The suggestion/motivation for doing so would have been to conserve power (Flach paragraph [0139]).

Claims 8, 11, 12, 36, 39, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoctor and Poklemba as applied to claims 7, 10, 35 and 38 above, and further in view of Leeper ("wireless data blaster", Scientific American, 2002 Vol 286, No. 5 May 2002 pp 64-69).

As per claims 8 and 36, Hoctor and Poklemba disclose claims 7 and 34. Hoctor and Poklemba don't disclose that the cut-off frequency is approximately 3 gigahertz. Leeper discloses that the cut-off frequency in a UWB system is approximately 3 gigahertz (page 68 figure 2 and page 69 second paragraph). Hoctor and Leeper are analogous art because they are from the same field of endeavor of UWB. Hoctor, and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and

Poklemba the frequency rage disclosed by Leeper. The suggestion/motivation for doing so would have been to transmit very high data speed (Leeper page 66 right column 4th paragraph beginning with "At the present").

As per claims 11 and 39, Hoctor and Poklemba disclose claims 10 and 38. Hoctor and Poklemba don't disclose that the cut-off frequency is approximately 3 gigahertz. Leeper discloses that the cut-off frequency in a UWB system is approximately 3 gigahertz (page 68 figure 2 and page 69 second paragraph). Hoctor and Leeper are analogous art because they are from the same field of endeavor of UWB. Hoctor, and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the frequency rage disclosed by Leeper. The suggestion/motivation for doing so would have been to transmit very high data speed (Leeper page 66 right column 4th paragraph beginning with "At the present").

As per claims 12 and 40, Hoctor, Poklemba and Leeper disclose claims 11 and 39. Leeper also discloses a center frequency of the passband is approximately 5 gigahertz (page 68 figure 2 and page 69 second paragraph). Hoctor and Leeper are analogous art because they are from the same field of endeavor of UWB. Hoctor, and Poklemba are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the frequency rage disclosed by Leeper. The suggestion/motivation for doing

so would have been to transmit very high data speed (Leeper page 66 right column 4th paragraph beginning with "At the present").

Claims 13 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoctor and Poklemba as applied to claims 10 and 39 above, and further in view of Claydon (US 5793818 A).

As per claims 13 and 41, Hoctor and Poklemba disclose claims 10 and 38. Hoctor and Poklemba don't disclose that the transfer function of the matched filter approximates a transfer function of the transmitter transmitting the incoming signal. It is inherently to a matched filter that the transfer function of the matched filter approximates a transfer function of the transmitter transmitting the incoming signal and Claydon discloses that the transfer function of the matched filter approximates a transfer function of the transmitter transmitting the incoming signal (figure 6 block 54 and 567; column 8 lines 8-22). Hoctor, Poklemba and Claydon are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the matching filter disclosed by Claydon. The suggestion/motivation for doing so would have been to to restore the signal to its pre-transmission character (Claydon column 8 lines 9-14).

Claims 25, 26, 53 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoctor and Poklemba as applied to claims 1 and 29 above, and further in view of Tran (US 5715276 A) (with LeFever (US 4599732 A) to support motivation).

As per claims 25 and 53, Hoctor and Poklemba disclose claims 1 and 29, Hoctor and Poklemba don't disclose one multi-level quantizer. Tran discloses one multi-level quantizer (figure 1 and column 20 lines 1-14). Hoctor, Poklemba and Tran are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the multi-level quantizer disclosed by Tran. The suggestion/motivation for doing so would have been to obtain the desired accuracy (see LeFever (US 4599732 A) column 5 lines 4-9).

As per claims 26 and 54, Hoctor, Poklemba and Tran disclose claims 25 and 54, Tran also discloses the at least one multi-level quantizer is selected from a group consisting of: a mu-law quantizer, a 4 level quantizer, a 8 level quantizer, and a 16 level quantizer (figure 1 and column 20 lines 1-14). Hoctor, Poklemba and Tran are analogous art because they are from similar problem solving area of carrier recovery. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the decoding system disclosed by Hoctor and Poklemba the multi-level quantizer disclosed by Tran. The suggestion/motivation for doing so would have been to obtain the desired accuracy (see LeFever (US 4599732 A) column 5 lines 4-9).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is (571) 272-3119. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juan Alberto Torres
07-31-2006